

1961

Some personality correlates of probability-preferences in imaginary and actual risk-taking.

Bernard. Cameron

University of Massachusetts Amherst

Follow this and additional works at: <https://scholarworks.umass.edu/theses>

Cameron, Bernard., "Some personality correlates of probability-preferences in imaginary and actual risk-taking." (1961). *Masters Theses 1911 - February 2014*. 1373.

Retrieved from <https://scholarworks.umass.edu/theses/1373>

This thesis is brought to you for free and open access by ScholarWorks@UMass Amherst. It has been accepted for inclusion in Masters Theses 1911 - February 2014 by an authorized administrator of ScholarWorks@UMass Amherst. For more information, please contact scholarworks@library.umass.edu.

UMASS/AMHERST



312066013578782

SOME PERSONALITY CORRELATES
OF PROBABILITY-PREFERENCES IN IMAGINARY AND
ACTUAL RISK-TAKING

CAMERON - 1961

LD
3234
M268
1961
C182

SOME PERSONALITY CORRELATES OF FANTASY-ENVIRONMENT
IN IMAGINARY AND ACTUAL ADJUSTMENT

By
Bernard Canoron

Digitized by the Internet Archive
in 2014

Thesis submitted to the Graduate Faculty in
partial fulfillment of the requirements
for the degree of
Master of Science

University of Massachusetts, Amherst
September, 1961

ACKNOWLEDGMENTS

The author wishes to express formal appreciation to his wife, Louise, who, by her refusal to adopt an evaluative attitude upon its becoming fashionable, provided him with reason for bothering to complete this study.

Thanks as well, to Dr. J. L. Myers, who, through his numerous and expeditious readings of the manuscript, incisive critical commentary, and complete cooperative consideration, helped realize the study's completion.

Further thanks to Dr. Arnold Trehab for the wisdom of his counsel, and for the benefit derived from exposure to that benign, tolerant sophistication so rare in those of experimental inclination.

The author also wishes to thank Hal Goldstein, Barry Hollman, Ray Reilly, George Salts, and George Tuppa for their participation, suggestions, and unwavering moral support.

JAN 23 1959
7
61-10-1

TABLE OF CONTENTS

| | Page |
|---|------|
| ACKNOWLEDGMENTS | ii |
| TABLE OF CONTENTS | 111 |
| LIST OF TABLES AND FIGURES | iv |
| INTRODUCTION | 1 |
| METHOD | 5 |
| Apparatus | 6 |
| Bets | 6 |
| Procedure | 8 |
| First session | 8 |
| EYES | 8 |
| Imaginary risk-taking | 8 |
| Second session | 9 |
| Actual risk-taking | 9 |
| Subjects | 10 |
| RESULTS AND DISCUSSION | 10 |
| Group Probability Preferences | 10 |
| Personality Variables and Betting Preferences | 18 |
| CONCLUSIONS | 26 |
| SUMMARY | 27 |
| REFERENCES | 28 |
| APPENDIX | 30 |

LIST OF TABLES AND FIGURES

TABLE

| | Page |
|---|------|
| 1. Bets used in this experiment | 7 |
| 2. Mean MPO on BEV and NEV Bets, and MPL on NEV Bets for β_0 in high or low quartile of distribution for each EPTS need | 19 |

FIGURE

| | |
|--|----|
| 1. Preferences as a function of probability of winning for positive expected value bets | 11 |
| 2. Preferences as a function of probability of losing for negative expected value bets | 12 |
| 3. Preferences as a function of probability of winning for zero expected value bets | 13 |

INTRODUCTION

Among the increasing number of studies aimed at delineating the parameters of the decision to take risks, relatively few (Atkinson, 1958; Lippitt, 1953; Seidell, Ratoosh, & Mines, 1959; Atkinson et al, 1960) have attempted to relate personality variables to risk-taking behavior. Yet, it is reasonable to assume that motivation contributes as much toward determining the way a person behaves under conditions of risk as it does in most other situations. The assumption seems particularly plausible when one considers the high variability of individual behavior in risk-taking. People do not always perform so as to make their chances of success optimal (Mosteller & Ragoes, 1951; Edwards, 1953; 1954; 1955) and predictions about how persons will behave under conditions of risk which are based solely on consideration of attributes of the external stimulus conditions lack precision (Edwards, 1955; Coombs & Pruitt, 1960).

The bulk of what has been done in attempting to relate motivation to risk-taking behavior has been concerned with the motive to approach success (need achievement) as inferred from content analysis of responses to the McClelland adaptation of the Thematic Apperception Test (TAT) (McClelland et al, 1953) or to the French Test of Insight (FTI) (French, 1958) a modified apperceptive test. The theoretical model which served to generate much of this research has been stated by Atkinson (1958; 1960). It predicts that individuals in

whom the motive to approach success is stronger than the motive to avoid failure will prefer tasks with intermediate probabilities of success; but that individuals in whom the motive to avoid failure is stronger (inferred from low need achievement) will avoid intermediate risk and prefer tasks with very high or very low probabilities of success. Although Atkinson conceives the model as being applicable to risk-taking situations (games of chance) as well as to those tasks where skill is required, experimental evidence in regard to the former has been inconclusive.

Seidell, Mattoon & Minas (1959) had subjects (ss) bet on the outcome of tossing a pair of dice. The ss were given money with which to bet and told that they might keep the amount they won. On each of fifty rolls of the dice, the subject (s) selected a bet from nine alternative outcomes with known objective probabilities but different expected values. These experimenters (ss) found that ss who scored high in need achievement (as measured by content analysis of responses to TAT stimuli) selected bets with intermediate probabilities significantly more often than those who scored low in need achievement. There are, however, several methodological difficulties in this study. The TAT cards used were not those best suited to evoking achievement-related imagery. Apparently the experimenters' (ss') choice of cards was dictated by an interest in dependency, press dominance, and the nature of heterosexual relationships as well as in need

achievement. A second problem concerns the authors' statement that, "in general, the scoring of need achievement in a story fulfilled the criteria... for Achievement Imagery, although some cases of Doubtful Achievement Imagery were also included" (1959, p. 22). It is not clear just what "in general" means; nor is the inclusion of the cases of Doubtful Achievement Imagery in any way justified.

Atkinson et al (1960) studied the preferences of a group of ss for imaginary bets equated for expected monetary value but differing in probability of winning in a dice game where the ss were told to "imagine that they were in a gambling situation with friends shouting encouragement while they rolled a single die" (1960, p. 29). Need achievement was measured by the FTI. The preferences of the high need achievement group showed merely a chance distribution. The low need achievement group avoided intermediate risk bets ($4/6$, $3/6$, $2/6$) and showed a significant preference for extreme risk bets ($1/6$ or $5/6$). Thus only the latter group performed in the manner predicted. In this study the range of probabilities is relatively small, and the ss placed only imaginary bets.

In another study, Littig (1959) had ss roll a pair of dice ninety-six times for each of five stated probabilities of success (.10, .30, .50, .70, .90) and found that ss in whom need achievement was assumed to be stronger (as measured by responses to the McClelland adaptation of the TAF)

preferred the highest probability of success rather than the predicted intermediate probabilities. However, the experimenter's (E's) data did support the hypothesis that ss in whom motivation to avoid failure was assumed to be stronger would avoid intermediate risk; these ss preferred the lowest probability of success. Littig interpreted his results as indicating that ss who are highly motivated to achieve, discriminate between activities which require skillful performance (where winning is a personal accomplishment) and games of chance (where it is not). However, this interpretation does not seem to explain data reported by Ward Edwards (1953) who had ss express their preferences for one of each of 84 pairs of bets shown to them one at a time. Using a specially designed pinball game as his gambling apparatus, and three experimental conditions (just imagining gambling, gambling for worthless poker chips, and gambling for real money) Edwards found that his ss preferred bets with a .50 probability of winning to those with either a 1/8 or an 8/8 probability. The ss in this study were twelve Harvard undergraduates. Although the experimenter (E) did not measure need achievement, his ss do seem representative of a group in whom the presence of high need achievement might readily be inferred.

The results of the above studies make it apparent that there is no unequivocal evidence as to whether the need achievement variable is relevant to explaining behavior in risk-taking situations. The inconclusiveness of the data,

moreover, raises the issue of whether the role of personality variables in risk-taking might be more profitably studied by considering motives other than need achievement. Stability coefficients for need achievement are not very imposing (Lowell, 1950, $r = .22$; Morgan, 1953, $r = .64$; Birney, 1959, $r = .29$). The subjective scoring system germane to both the TAT and the FTI contributes to this and detracts from the value of the tests as research instruments.

The Edwards Personal Preference Schedule (EPPS) (Edwards, 1954) is an instrument that was seemingly well suited to an empirical inquiry into the role of personality variables in risk-taking. It provides a direct measure of 15 "relatively independent normal personality variables" (1954, p. 1) including need achievement. Although its need achievement measure does not correlate well with the TAT measure (Birney, 1959, $r = -.002$, $N = 300$) its stability coefficient is relatively high (Edwards, 1954, p. 19, $r = .74$, $N = 1509$). It has the additional advantages of a wide range of needs with generally very high stability coefficients (1954, p. 19, $r = .74$ to $.88$, $N = 89$) very good normative data (1954, p. 12, $N = 10,472$) and an objective scoring system.

The purpose of this study was to provide data which would help to clarify the relationship between need states and betting preferences and which would indicate some personality variables worth extended consideration in attempting to predict how an individual will behave in a risk-taking situation. This was to be achieved by using a test which provided a

measure of many needs, an expanded range of probabilities, bets of several expected values, and real as well as imaginary risk-taking.

METHOD

Apparatus

The apparatus was a manually operated roulette wheel eight inches in diameter. A cardboard template was fitted over the rotating central disc. The surface of this template was marked off into eight equal sectors, each of which contained one number, a number from one through eight. One of four projecting armatures on the central spindle of the wheel was painted red and served to indicate the winning number.

Bets

Three sets of eight bets were used, and all were stated with reference to the apparatus. The bets are shown in Table 1. The expected value of a bet is the average amount of money to be won (or lost) by playing the bet. Each bet in the first group has a positive expected value (PEV) of \$0.525. Each of the next group of eight bets has a negative expected value (NEV) of -\$0.525. The last group consists of eight bets, each of which has zero expected value (ZEV) (\$0.00). Each bet at a given expected value level was paired with all others at the same level, producing 28 pairs of bets at each expected value level. Each pair of bets was typed on 3" x 7"

Bets used in this experimentPositive expected value

1. If the wheel stops on 4, you win \$4.20. If it stops on anything else, you win nothing.
2. If the wheel stops on 1 or 7, you win \$2.10. If it stops on anything else, you win nothing.
3. If the wheel stops on 2, 4, or 6, you win \$1.40. If it stops on anything else, you win nothing.
4. If the wheel stops on 2, 4, 7, or 8, you win \$1.05. If it stops on anything else, you win nothing.
5. If the wheel stops on 2, 3, 5, 7, or 8, you win \$0.84. If it stops on anything else, you win nothing.
6. If the wheel stops on anything but 3 or 6, you win \$0.70. If it stops on anything else, you win nothing.
7. If the wheel stops on anything but 5, you win \$0.60. If it stops on anything else, you win nothing.
8. Regardless of what number the wheel stops on, you win \$0.9

Negative expected value

The eight bets with negative expected value were identical with those of positive expected value listed above except that the verb in each bet was lose instead of win.

Zero expected value

1. If the wheel stops on 4, you win \$4.20. If it stops on anything else, you lose \$0.60.
2. If the wheel stops on 1 or 7, you win \$2.10. If it stops on anything else, you lose \$0.70.
3. If the wheel stops on 2, 4, or 6, you win \$1.40. If it stops on anything else, you lose \$0.84.
4. If the wheel stops on 2, 4, 7, or 8, you win \$1.05. If it stops on anything else, you lose \$1.05.
5. If the wheel stops on 2, 3, 5, 7, or 8, you win \$0.84. If it stops on anything else, you lose \$1.40.
6. If the wheel stops on anything but 3 or 6, you win \$0.70. If it stops on 3 or 6, you lose \$2.10.
7. If the wheel stops on anything but 5, you win \$0.60. If it stops on 5, you lose \$4.20.
8. Regardless of what number the wheel stops on, you neither win nor lose.

paper, and dittoed copies of the entire set of bets were assembled. The order of presentation of bets was completely random. Each S was given a dittoed copy of the total deck which consisted of 84 paired bets which were stapled into nine separate booklets. Eight booklets contained nine pairs of bets, and one contained twelve pairs.

Procedure

First session

EPFS. The EPFS booklets and answer sheets were distributed. Subjects were asked to read silently the directions from the cover of the booklet while E read them aloud. Subjects were requested to return these materials as soon as they had completed them and to wait for further instructions. The EPFS always preceded the risk-taking tasks. It seemed advantageous to have these scores relatively uninfluenced by the experimental conditions.

Imaginary risk-taking. When all Ss had completed the EPFS, the booklets of bets and a specially prepared answer sheet were distributed, face down, to each S. The experimenter showed the group the apparatus and read the following instructions.

Most of you have probably taken a chance at one time or another on the spin of a wheel similar to this one. The way it usually works is that you bet on where the wheel will stop. (E spins wheel.) If it stops at the number you bet on, you win some money, or perhaps a prize of some kind. Well, we have no money or prizes to give away right now, but we would like you to make some bets anyway.

Each of you has several slips of paper. When you turn over the top one you will see that it has two

bets printed on it. What I would like you to do is indicate which one of the bets you would prefer to make if you were actually betting on where the wheel would stop after I had given it a spin. Indicate the bet you prefer by encircling the appropriate letter on your answer sheet. Remember, you must choose one of each pair of bets.

When I tell you to begin, look at the bets on each slip, make your choice, and then turn the slip over before going on to the next one. Do not look back at any slip once you have made your choice. Work as quickly as you can, and try not to spend more than about ten seconds on any pair of bets. Any questions? Go ahead.

Second session

The second session followed the first within a two to five day interval.

Actual risk-taking. The experimenter handed out the bets and answer sheets and read the following instructions.

This is a study of how people behave in a real gambling situation. You remember that I showed you this wheel the last time we met, and you made some imaginary bets. This time you will be betting for real money. Each of you has a pack of slips in front of you like those we used before. Again, each slip has a pair of bets typed on it, and you are to indicate which one of the bets you prefer by encircling the appropriate letter on your answer sheet. However, this time, after you have finished making all your choices, I will spin the wheel for each bet and you will win or lose real money. Each time I spin the wheel, my partner will check your bets and give you your winnings or collect your losses. When we have finished running off all the bets, anything that you have won will be yours to keep. If you lose, you will be paid only what you have earned for participating in the study. Most people manage to win a respectable amount of money, at least a couple of dollars. Do you have any questions? Work as quickly as you can and do not spend too much time on any one bet. Go ahead.

Subjects had been guaranteed a minimum return of \$1.50 per hour for the time spent participating in the study.

Outcomes for the actual risk-taking were not manipulated experimentally; they were determined by chance.

Imaginary risk-taking always preceded actual risk-taking; the order of conditions was not counterbalanced. It seemed probable that knowledge of results of the strategy employed for actual betting would influence imaginary betting. It seemed unlikely that imaginary betting would affect actual betting in the absence of feedback.

Subjects

The *As* were 69 male, undergraduate volunteers attending the University of Massachusetts summer school. The age range of the sample was 17 to 28 years with a median age of 20 years. Subjects were run in groups of eight to twelve for the initial session (EPPS and imaginary risk-taking). For the second session (actual risk-taking) groups of three to five *As* were run.

RESULTS and DISCUSSION

Group Probability Preferences

The results for PEV (positive expected value) bets are presented in Figure 1. The figure shows relative preference as a function of probability of winning with actual versus imaginary betting as the parameter. The measure of relative preference was the number of times a bet of a given probability was chosen; namely, seven times per subject. A relative preference of 1.00 would indicate that each *S* chose a particular bet each time it was offered. Each point on the

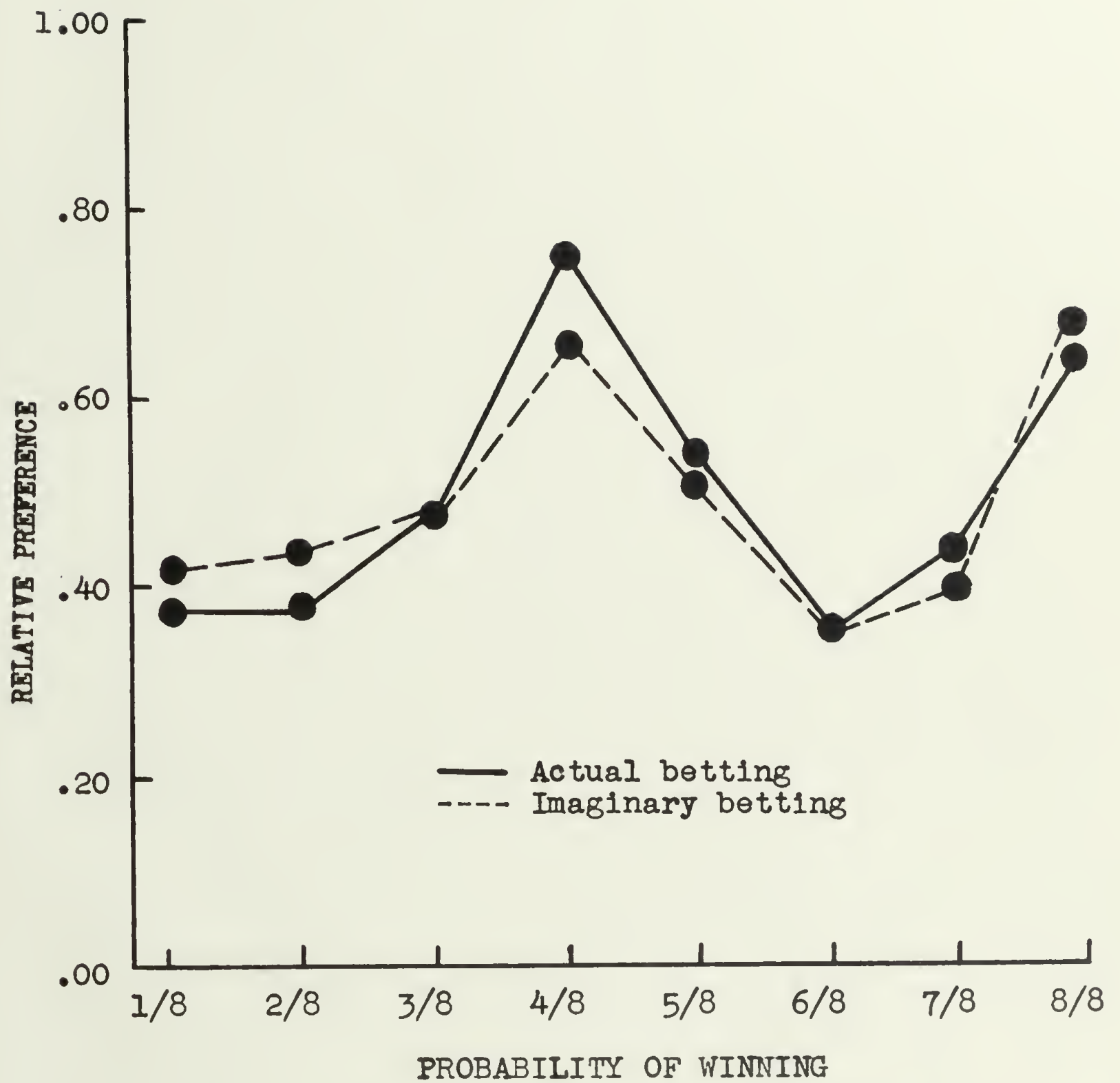


Figure 1: Preferences as a function of probability of winning for positive expected value bets.

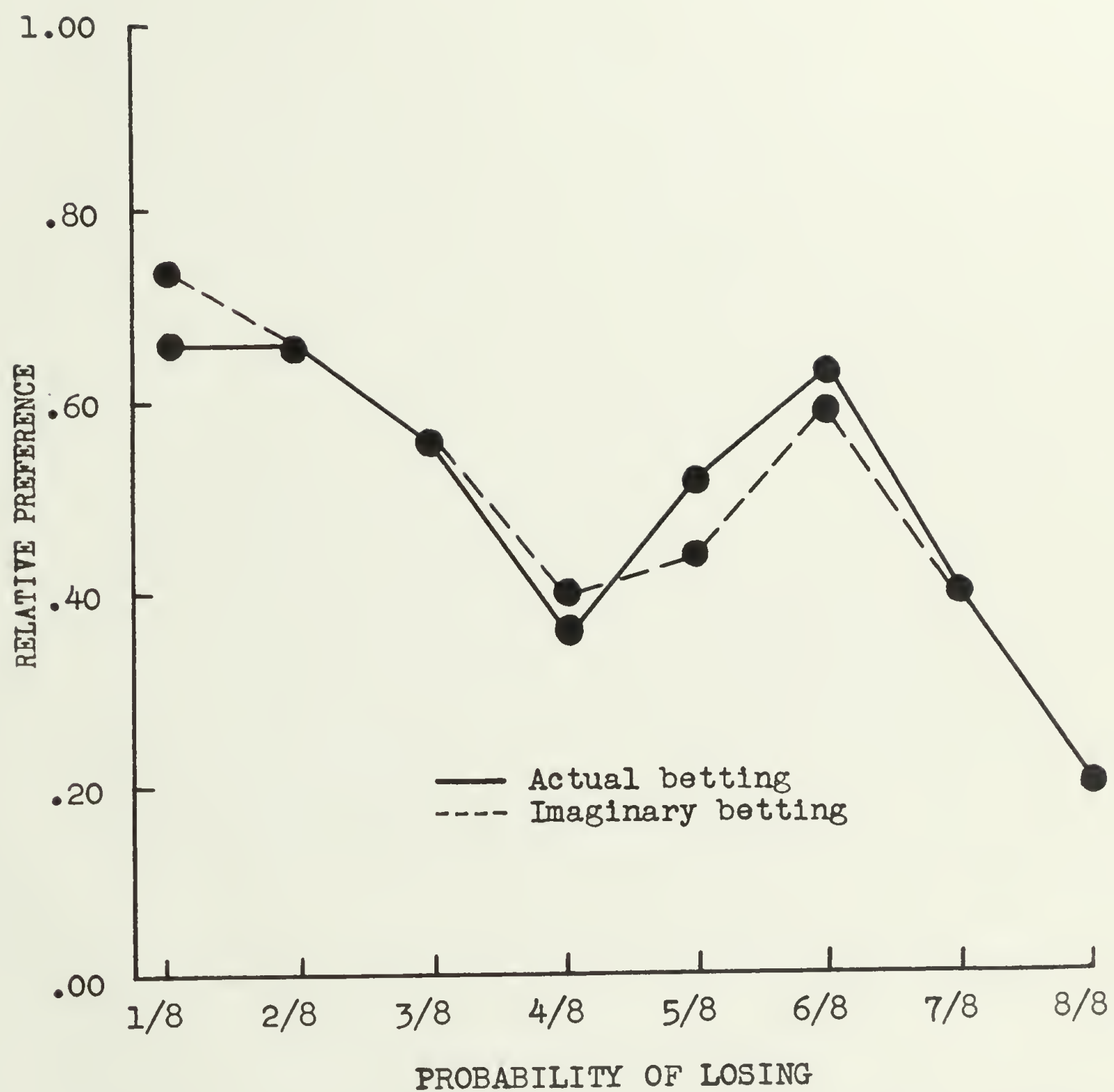


Figure 2: Preferences as a function of probability of losing for negative expected value bets.

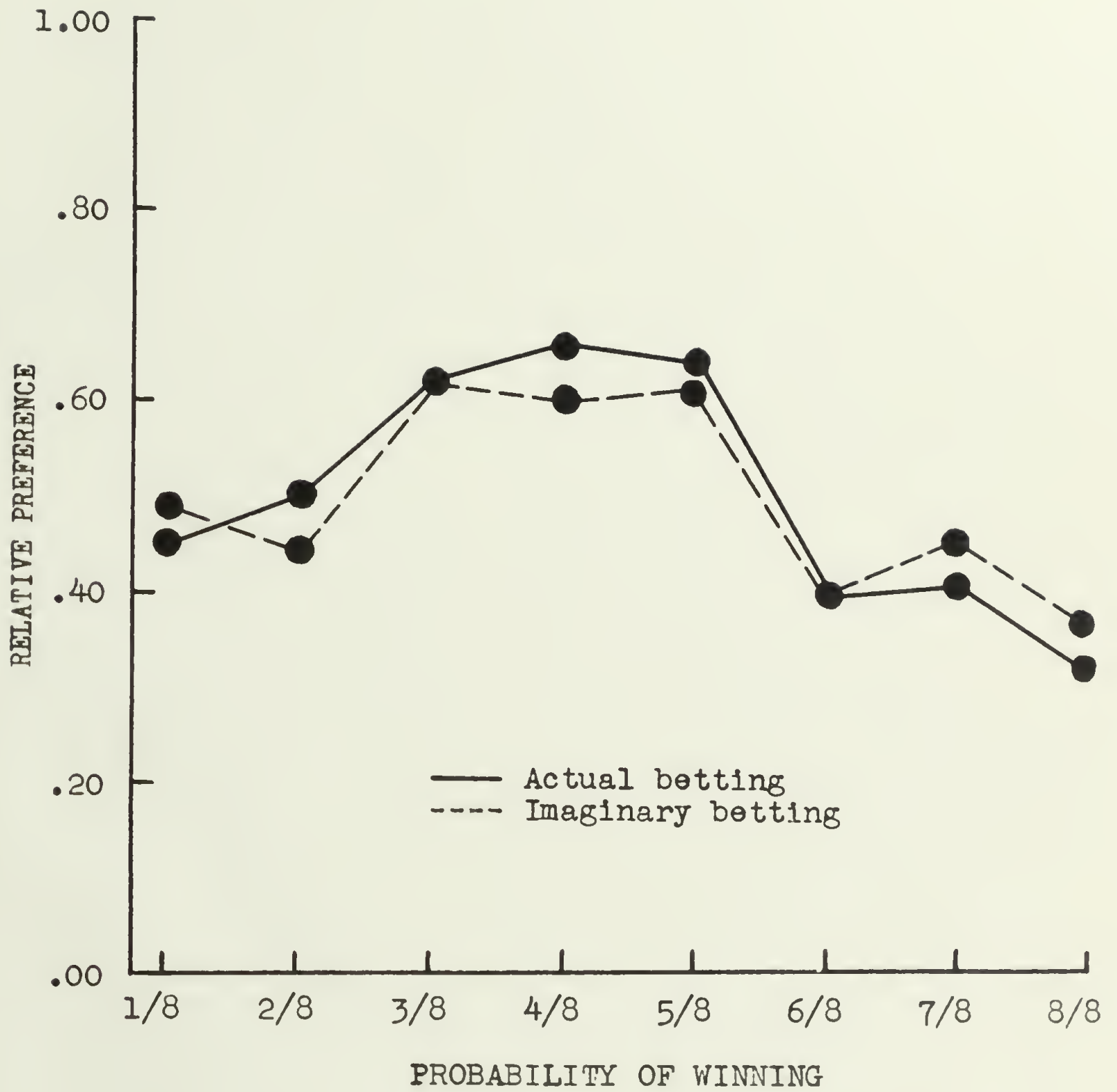


Figure 3: Preferences as a function of probability of winning for zero expected value bets.

graph represents the mean percentage of choices for 69 ss. Both curves show a positively accelerated upward trend from $1/8$ to $4/8$, a sharp downward trend to $6/8$, and a reversal upward from $6/8$ to $8/8$. The significant features of this graph are the peak at $4/8$ and the valley at $6/8$.

The results for NEV (negative expected value) bets are presented in Figure 2 which shows relative preference as a function of probability of losing with actual versus imaginary betting as the parameter. Each point on the graph represents the mean percentage of choices for 69 ss. Both curves show a downward trend from $1/8$ to $4/8$, an upward reversal to $6/8$, and a sharp downward slope to $8/8$. Subjects chose the $1/8$ probability of losing most and the $8/8$ probability of losing least. Among the remaining bets, ss chose the $4/8$ probability least often and the $6/8$ probability most often.

The results for ZEV (zero expected value) bets are presented in Figure 3 which shows relative preference as a function of probability of winning with actual versus imaginary betting as the parameter. Each point on the graph represents the mean percentage of choices for 69 ss. The graph shows a general upward curve from $1/8$ to $4/8$, a sharp drop from $5/8$ to $6/8$, followed by a slight increase to $7/8$ and a slight decrease to $8/8$. The least preferred bet is indicated by the $8/8$ point on the graph which refers to the item, "Regardless of what number the wheel stops on, you neither win nor lose," a riskless choice. Of the bets which involve risk, ss chose the $4/8$ bet most, and the $6/8$ bet least.

A comparison of the three figures reveals that the difference between imaginary and actual betting is negligible; subjects tend to prefer the same bets whether or not they can actually expect to win money. This finding is supported by several other studies. Edwards (1953) found that js tended to prefer the same bets whether the gambling was imaginary, for worthless chips, or for real money. Katz (1961) investigated the effects of a number of variables on the decision to gamble or not to gamble and found little difference in whether js played for worthless chips, or chips worth five cents. Suydam (1961) found that js reacted very differently to bets of different sizes, being more conservative with those of larger amounts, even though those bets were only imaginary. These data suggest that, under certain experimental conditions, the investigator whose financial resources are limited can obtain data as pertinent to the problem of risk-taking as one whose resources permit setting up a monetary gambling situation. Furthermore, the data from the present study in conjunction with that from other investigations (Beckel, Ratoosh & Hines, 1959; Myers, Reilly, & Faub, 1961; Suydam, 1961) shows that many js bet conservatively even when they cannot lose; i.e., when their own money is not involved. This implies that js perceive experimental risk-taking as constituting a life-like gambling situation.

Figures 1 and 2 are almost mirror images of one another; bets which js preferred when they were stated in the "win" form were avoided when they were stated as "lose." The bet

which was chosen most when its expected value was positive ($4/8$) was chosen infrequently when its expected value was negative. Conversely, the $6/8$ bet, which was liked least when its expected value was positive, was highly preferred when its expected value was negative. The one exception to this is the $0/8$ NEV bet which is chosen less than might be predicted. Subjects avoid a certain loss relatively more than they are attracted by a sure win.

A comparison of the graph for the PEV bets (Figure 1) with that for the NEV bets (Figure 3) reveals that preferences among the latter are less clearly differentiated, as exemplified by a less pronounced peak at $4/8$. Subjects are seemingly more cautious about their preferences when any given bet involves the possibility of loss as well as gain, as is the case with the NEV bets.

The NEV curve does not show the upturn characteristic of the PEV curve at the $8/8$ point, the NEV $8/8$ bet having been chosen less than 50 per cent of the time it was offered. This occurred despite the fact that alternatives to the sure zero payoff involved a possible loss. Therefore, it is hypothesized that either the alternative options to the $8/8$ NEV bet have an average positive utility (subjective value), or that subjects overvalue the probability of winning, or that subjects prefer gambling to not gambling, or that some combination of these factors operates to lower the choice of the $8/8$ NEV bet.

The group probability preference data of this experiment

are consistent with those reported by Edwards (1953). The latter, using bets identical in probability and expected value to those of the present study, but different in having been stated with reference to a "rigged" pinball game, ran 12 §s individually. There are some differences that exist in the results of the two investigations. Curves for the ZEV bets are flatter, the peak and valley of the NEV curves are more pronounced, the "mirror" effect manifest between PEV and NEV curves is more conspicuous, and the degree of similarity between imaginary and actual risk-taking is more marked in the present study than in Edwards'. However, these differences are minor, and may be attributable to the small, relatively homogeneous sample used by Edwards, or to differences in the experimental conditions; the overall consistency of the preference pattern found in both studies is unmistakable.

The implications of this pattern are that either §s overestimate the probability of winning associated with a 50-50 bet and underestimate that associated with a 75-25 bet, or that there are differences in the utility of payoff associated with the bets. Although probability and payoff are usually confounded in most real life gambling situations, conceivably some §s might prefer specific probabilities regardless of what they paid, or particular payoffs regardless of the probabilities associated with them. This suggests that there is a need for fundamental measurement studies concerned with determining the function which relates utility and money, and the function

which relates utility and money, and the function which relates subjective and objective probability. Recently a start has been made in this direction (Mosteller & Nogee, 1951; Davidson, Suppes, & Siegel, 1957).

One further implication in comparing the present study with Edwards' is that many more individuals (69 as opposed to 12 ss) can be run in a simpler experimental situation (group as opposed to individual betting) with simpler apparatus (roulette wheel as opposed to an elaborate pinball game) with little effect on the results.

Personality Variables and Betting Preferences

The previously used measure of per cent choice does not readily lend itself to statistical comparisons among the groups dichotomized on EPPS needs. Therefore, a measure which would permit such comparisons to be made was devised. For PEV bets, the positive payoff associated with each bet was multiplied by the number of times S chose the bet; the resultant eight cross-products were then summed. A ZEV maximum possible gain (MPG) score was similarly computed for each S. A NEV maximum possible loss (MPL) score was obtained by summing the cross-products of loss and number of choices.

In this experiment, probability was confounded with payoff; i.e., there is no way of separating probability from payoff preferences. In the interest of conciseness, the following discussion refers only to payoff preferences. It should be

Table 2

Mean MPG on PEV and ZEV bets, and MPL on NEV bets for β s in high or low quartile of distribution for each EPPS need.

| Need | Quart. | PEV Bets | | NEV Bets | | ZEV Bets | |
|------|--------|----------|---------|----------|---------|----------|---------|
| | | Actual | Imagin. | Actual | Imagin. | Actual | Imagin. |
| ach | High | 30.52 | 36.63 | 48.79 | 50.34 | 36.31 | 39.35 |
| | Low | 36.18** | 32.32 | 46.12 | 46.55 | 40.11 | 34.29 |
| def | High | 33.49 | 35.25 | 48.68 | 47.66 | 35.54 | 36.17 |
| | Low | 37.24 | 39.69 | 45.90 | 49.23 | 40.39 | 38.86 |
| exh | High | 36.29 | 37.15 | 43.95 | 44.84 | 39.82** | 39.11 |
| | Low | 32.56** | 36.24 | 45.03 | 46.89 | 35.89 | 38.24 |
| aut | High | 34.69 | 34.25* | 49.59 | 52.22** | 36.97 | 35.50 |
| | Low | 37.22 | 38.66 | 46.62 | 46.98 | 37.74 | 37.89 |
| aff | High | 37.24 | 38.57 | 45.03 | 48.73 | 39.20 | 41.01 |
| | Low | 34.34 | 39.01 | 47.70 | 47.80 | 37.94 | 38.12 |
| int | High | 33.94 | 34.65 | 45.76 | 48.94 | 38.10 | 34.48 |
| | Low | 35.47 | 38.58 | 46.94 | 48.51 | 35.34 | 39.31 |
| suc | High | 34.41 | 37.79 | 47.80 | 47.50 | 37.13 | 35.68 |
| | Low | 34.75 | 34.69 | 44.42 | 46.90 | 39.36 | 38.36 |
| dom | High | 36.11* | 40.14* | 48.68 | 48.48 | 40.16 | 40.38 |
| | Low | 31.46 | 36.14 | 46.41 | 48.33 | 39.70 | 39.99 |
| aba | High | 33.12 | 34.40 | 48.58 | 45.85** | 37.64 | 37.75 |
| | Low | 32.52 | 36.52 | 45.47 | 51.33 | 38.17 | 35.45 |
| mur | High | 35.08 | 37.08 | 45.52 | 48.59 | 37.16 | 39.17 |
| | Low | 38.24 | 39.02 | 43.74 | 45.70 | 40.68 | 38.83 |
| chg | High | 35.60 | 37.99 | 45.75 | 48.67 | 37.45 | 39.09 |
| | Low | 37.21 | 37.34 | 46.61 | 46.59 | 40.04 | 39.09 |
| end | High | 33.41** | 38.68 | 45.66 | 48.59 | 38.62 | 38.76 |
| | Low | 40.72 | 40.25 | 44.90 | 48.09 | 39.24 | 39.44 |
| het | High | 36.80 | 36.71 | 46.43 | 50.57 | 37.19 | 37.12 |
| | Low | 32.66 | 36.42 | 47.21 | 48.49 | 39.00 | 37.92 |
| agg | High | 38.25 | 41.28** | 46.85 | 46.34 | 39.79 | 41.96* |
| | Low | 34.96 | 35.01 | 46.53 | 48.65 | 37.54 | 36.62 |

** "t" significant at .05 level (two-tailed test)

* "t" at .10 level (two-tailed test)

borne in mind, however, that the MPG and MPL measures described above do reflect probability preferences. High MPG or MPL scores indicate a preference for low probabilities, and conversely, a preference for high probabilities is denoted by low MPG or MPL scores.

The figures presented in Table 2 are mean MPG (for PEV and ZEV bets) and MPL (for NEV bets) scores computed for 5s whose EPPS scores placed them in the high or low quartile of the distribution on each need. There were 17 5s in each quartile. The ranges of MPG and MPL scores are comparable for PEV, ZEV, and NEV bets. After inspecting the data shown in Table 2, "t" tests were done on those differences which appeared relatively large. In the absence of previous experimentation there seemed to be no sound a priori basis for predicting which of the EPPS needs would discriminate between high versus low payoff bettors. Since the major purpose of the study was to provide data which would permit the generation of testable hypotheses about the relationship between personality variables and risk-taking, rather than to test existing hypotheses, treating the results in this way seemed partially justified. However, because the data was handled as it was--selecting comparisons to be made on an a posteriori basis--the results which follow must be viewed with caution, and regarded only as tentative evidence to be confirmed or disconfirmed by subsequent research.

Inspection of Table 2 reveals that 5s who scored high in exhibition (exh) tended to prefer higher payoff bets on PEV

and ZEV bets. They also risked the possibility of higher loss on NEV bets. In contrast, ss low in exhibition tended to play conservatively regardless of expected value; they chose bets which yielded wins or losses of smaller amounts of money. For PEV and ZEV bets, ss high in aggression (agg) behaved like those high in exhibition, while ss low in aggression behaved like those low in exhibition. For NEV bets there was no apparent difference between ss high or low in aggression. On PEV bets, ss high in dominance (dom) behaved like those high in exhibition (or aggression); those low in dominance like those low in exhibition (or aggression). For ZEV and NEV bets there is no appreciable difference between ss high or low in dominance.

Subjects high in autonomy (aut) tended to play conservatively. For PEV and ZEV bets they chose those with lower payoffs, while ss low in autonomy tended to prefer the higher payoff bets. For NEV bets, ss high in autonomy risked the possibility of losing larger amounts than those low in autonomy. For PEV bets, ss high in endurance (end) tended to prefer lower payoff bets, while those low in endurance tended to prefer higher payoff bets. There is no appreciable difference between ss high or low in endurance for NEV or ZEV bets.

Although the "t's" between high versus low achievement (ach) groups for PEV bets, and high versus low abasement (aba) groups for NEV bets are statistically significant, the lack of

any consistent direction to the betting pattern among these Ss suggests that these "t's" are spurious, and that the relationships are artifactual. There is no observable systematic interaction between high versus low need groups and actual versus imaginary betting; nor is there any observable systematic relationship between high versus low need groups and expected value.

The significant feature of the preceding results is the finding that three needs showed consistency in one direction, while two were consistent in the opposite direction. On one hand, Ss who scored high in exhibition, or aggression, or dominance behaved alike; they tended to prefer the higher payoff bets. Those who scored low in any of these needs tended to prefer the lower payoff bets. On the other hand, Ss who scored high in autonomy or endurance played conservatively; they tended to choose lower payoff bets. Those low in either of these needs tended to prefer the higher payoff bets. High exhibition, aggression, and dominance scores are contributed to be items reflecting needs which seem to operate primarily in relation to other persons.¹ In one sense they may be viewed as

1. These needs are defined by Edwards (1954, p. 11) as follows:

Exhibition: To say witty and clever things, to tell amusing jokes and stories, to tell about personal adventures and experiences, to have others notice and comment upon one's appearance, to say things just to see what effect it will have on others, to talk about personal achievements, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannot answer.

Aggression: To attack contrary points of view, to tell others

"sets" which predispose the individual to exert control over events through manipulation of interpersonal relationships. Satisfaction of these needs is contingent upon the reciprocity of social interaction. In contrast, high autonomy and endurance scores suggest a rather pronounced impersonal or task orientation.² In one sense they may be regarded as predispositions to influence the course of events by attempting to restrict the intrusion of others in governing one's relationship to the impersonal environment. The behavior of other individuals is much less important to the satisfaction of these needs than is

what one thinks about them, to criticize others publicly, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence.

Dominance: To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and influence others to do what one wants, to supervise and direct the actions of others, to tell others how to do their jobs.

2. These needs are defined by Edwards (1954, p. 11) as follows.

Autonomy: To be able to come and go as desired, to say what one thinks about things, to be independent of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in positions of authority, to avoid responsibilities and obligations.

Endurance: To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work.

one's own behavior. It is hypothesized that since individuals high in exhibition, aggression, or dominance require feedback from other persons in order to evaluate the "success" of their operational strategy, they would tend to behave in a manner calculated to draw attention to themselves. In regard to risk-taking, they would prefer what they perceive as bigger risks, in hope of eliciting a response from others. However, individuals high in autonomy or endurance, being less concerned with the admiration of others, and capable of sustained waiting for relatively small gratifications, would tend to choose what they perceive as low risk bets with high cumulative value.

Some additional support for the adequacy of the above interpretation stems from variance preference data collected from an experimental population similar to that of the present study.³ Subjects to whom the EPPS had been administered, were asked to indicate their preferences among bets, each having a 50-50 probability of occurrence but involving possible wins or losses of one, two, three, four, five, or six dollars. For example, S was asked to indicate which of the following bets he would choose if he were gambling on an unbiased roulette wheel. (a) If the wheel stops on an even number you win \$1.00. If it stops on an odd number you lose \$1.00. (b) If the wheel stops on an odd number you win \$6.00. If it stops on an even number you lose \$6.00. The six bets used

3. Fort, Jane. Personal communication, August, 1961.

were exhaustively paired with one another. Betting was imaginary. The RPPS needs which best discriminated between high versus low variance preferrers were aggression and autonomy. Subjects high in aggression preferred high variance bets; those high in autonomy, low variance bets.

There are two drawbacks to using the paired-comparison method for presenting bets. First, the technique is relatively insensitive; it gives little indication of an individual's strength of preference for a particular bet. As a result, the data it provides are difficult to statistically analyze. Second, the Ss option is overly clear-cut. Much of projective test theory is based on the assumption that an individual's responses to less structured situations tend to reveal more about his dynamics than do behaviors in highly structured contexts. Within certain limits, the more ambiguous the situation, the more need-determined the response. A technique recently proposed by Slovic, Lichtenstein, & Edwards (1961) in which S is asked to state the largest amount of money he would be willing to pay to play a desirable bet, or the smallest amount he would have to be paid to play an undesirable bet, has neither of the above disadvantages. The response measure appears to be more sensitive to strength of preference than that of simple choice, and the situation less structured for S, than is the case with the paired-comparison method. The bidding method should therefore result in data better suited to evaluating the effects of various situational and personality variables upon risk-taking.

The present study suggests the importance of needs for predicting certain varieties of risk-taking behavior. Some recent studies suggest that different kinds of personality variables may also be important. Seodol, Ratoosh, & Minas (1959) have reported that ss who preferred low-probability-high-payoff bets in a dice throwing experiment, scored significantly higher on the Theoretical value of the Allport-Vernon-Lindzey Study of Values (SV) than those who preferred high-probability-low payoff bets. In another study, Conger et al (1957) found that automobile drivers with high accident rates scored higher on the Theoretical value of the SV than those whose accident rates were moderate, or non-existent. These findings suggest that drivers with high accident rates may be similar to high-payoff bettors; both groups are apparently willing to take high risks. Moreover, these results in conjunction with those of the present study suggest that at least two levels of personality variables--consciously held attitudes, as well as needs--may influence certain kinds of risk-taking. Future research should neglect neither.

CONCLUSIONS

In general, it may be concluded that ss discriminate among bets equal in expected value. Over and above the pattern of group preferences as a whole, a further breakdown of ss into sub-groups dichotomized on the basis of need strengths produces betting patterns that differ among each other, suggesting the importance of personality variables. In order that predictions

expected values, and were presented by the method of paired comparisons.

The principal results were: (a) gs preferred the 4/3, and avoided the 6/3 probability of winning; (b) there was no significant difference between imaginary and actual betting; (c) gs high in exhibition, aggression, or dominance tended to prefer bets with high payoff and low probability of winning; (d) gs high in autonomy or endurance tended to prefer bets with low payoff and high probability of winning.

It was concluded that more detailed formulation of the role of personality variables in risk-taking was necessary and contingent upon further experimental investigation. Some directions for future research were suggested.

REFERENCES

1. Atkinson, J.W. Towards experimental analysis of human motivation in terms of motives, expectancies, and incentives. In Atkinson, J.W. (Ed.) Motives in fantasy, action, and society. Princeton: Van Nostrand, 1958.
2. Atkinson, J.W. Personality dynamics. In Farnsworth, P.R. & McHewer, G. (Eds.) Annual review of psychology, 1960, 11, 255-290.
3. Atkinson, J.W., Bastian, J.R., Earl, R.W., & Litwin, G. The achievement motive, goal setting, and probability preferences. J. abnorm. soc. Psychol., 1960, 60, 27-36.
4. Birney, R.C. The reliability of the achievement motive. J. abnorm. soc. Psychol., 1959, 58, 266-267.
5. Conger, J.J., Gaskill, H.S., Glad, D.D., Rainey, R.V., Sawrey, W.L., & Turrell, E.S. Personal and interpersonal factors in motor vehicle accidents. Amer. J. Psychiat., 1957, 113, 1069-1074.
6. Coombs, C.H. & Pruitt, D.G. Components of risk in decision making: probability and variance preferences. J. Exp. Psychol., 1960, 60, 265-277.
7. Davidson, D., Suppes, P., & Siegel, S. Decision making: an experimental approach. Stanford: Stanford Univer. Press, 1957.
8. Edwards, A.L. Manual. Edwards Personal Preference Schedule. New York: Psychological Corp., 1954.
9. Edwards, W. Probability preferences in gambling. Amer. J. Psychol., 1953, 66, 349-364.
10. Edwards, W. Probability preferences among bets with differing expected values. Amer. J. Psychol., 1954, 67, 56-67.
11. Edwards, W. The reliability of probability preferences. Amer. J. Psychol., 1954, 67, 68-95.
12. Edwards, W. Variance preferences in gambling. Amer. J. Psychol., 1954, 67, 441-452.
13. Edwards, W. The prediction of decisions among bets. J. Exp. Psychol., 1955, 50, 201-214.
14. French, Elizabeth. Development of a measure of complex motivation. In Atkinson, J.W. Motives in fantasy, action, and society. Princeton: Van Nostrand, 1958.

15. Katz, L. Monetary incentive and range of payoff as determiners of risk-taking. Paper read at East. Psychol. Ass., Philadelphia, April, 1961.
16. Littig, L.W. The effect of motivation on probability preferences and subjective probability. Unpublished doctoral dissertation, Univer. of Michigan, 1959.
17. Lowell, E.L. A methodological study of projectively measured achievement motivation. Unpublished master's thesis, Wesleyan Univer., 1950.
18. McClelland, D.C., Atkinson, J.W., Clark, R.A., & Lowell, E.L. The achievement motive. New York: Appleton-Century Crofts, 1953.
19. Marlowe, D. Relationships among direct and indirect measures of the achievement motive and overt behavior. J. Consult. Psychol., 1959, 23, 329-332.
20. Melikian, L. The relationship between Edwards' and McClelland's measures of achievement motivation. J. Consult. Psychol., 1958, 22, 296-298.
21. Mosteller, F. & Nogee, P. An experimental measurement of utility. J. Polit. Econ., 1951, 59, 371-404.
22. Morgan, H.H. Measuring achievement motivation with picture interpretations. J. Consult. Psychol., 1953, 17, 289-292.
23. Scodel, A., Ratoosh, P., & Minas, J.E. Some personality correlates of decision-making under conditions of risk. Behav. Sci., 1959, 4, 19-28.
24. Slovic, P., Lichtenstein, Sarah, & Edwards, W. Boredom: a vitiating variable in decision experiments. Paper read at Midwest. Psychol. Ass., Chicago, May, 1961.
25. Suydam, Mary. Two parameters of risk-taking behavior. Unpublished master's problem, Univer. of Mass., 1961.

APPENDIX A

Individual Raw Scores on the EPPS

| S | Need | | | | | | | | | | | | | | | |
|----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | sch | def | ord | exh | aut | aff | int | suc | dom | aba | nur | chg | end | het | agg | con |
| 1 | 14 | 6 | 7 | 18 | 18 | 11 | 8 | 16 | 16 | 16 | 15 | 22 | 8 | 24 | 11 | 11 |
| 2 | 8 | 9 | 12 | 19 | 19 | 13 | 19 | 4 | 25 | 13 | 16 | 4 | 9 | 21 | 19 | 13 |
| 3 | 18 | 10 | 10 | 14 | 21 | 13 | 15 | 10 | 18 | 9 | 15 | 20 | 3 | 26 | 8 | 13 |
| 4 | 18 | 9 | 10 | 15 | 20 | 4 | 18 | 5 | 18 | 7 | 16 | 16 | 20 | 20 | 14 | 15 |
| 5 | 18 | 12 | 22 | 15 | 8 | 11 | 22 | 2 | 16 | 12 | 10 | 14 | 16 | 20 | 12 | 10 |
| 6 | 13 | 12 | 16 | 14 | 16 | 12 | 21 | 10 | 12 | 18 | 19 | 13 | 12 | 7 | 15 | 12 |
| 7 | 13 | 11 | 5 | 11 | 13 | 21 | 25 | 12 | 20 | 11 | 16 | 15 | 7 | 24 | 6 | 11 |
| 8 | 20 | 11 | 7 | 14 | 12 | 11 | 24 | 12 | 21 | 5 | 12 | 20 | 19 | 15 | 12 | 12 |
| 9 | 16 | 9 | 7 | 6 | 21 | 14 | 10 | 19 | 12 | 9 | 15 | 19 | 13 | 22 | 18 | 10 |
| 10 | 19 | 11 | 3 | 13 | 21 | 15 | 20 | 10 | 18 | 7 | 8 | 20 | 8 | 17 | 20 | 13 |
| 11 | 8 | 14 | 15 | 20 | 15 | 15 | 12 | 7 | 12 | 9 | 8 | 21 | 19 | 19 | 16 | 13 |
| 12 | 14 | 8 | 11 | 13 | 9 | 19 | 15 | 13 | 24 | 9 | 15 | 21 | 10 | 18 | 11 | 12 |
| 13 | 16 | 13 | 10 | 20 | 10 | 7 | 21 | 11 | 23 | 12 | 14 | 14 | 14 | 13 | 12 | 9 |
| 14 | 17 | 3 | 4 | 13 | 20 | 17 | 22 | 8 | 22 | 10 | 16 | 11 | 17 | 12 | 18 | 13 |
| 15 | 16 | 6 | 11 | 12 | 17 | 6 | 24 | 4 | 18 | 18 | 8 | 19 | 11 | 28 | 12 | 14 |
| 16 | 14 | 5 | 8 | 16 | 19 | 14 | 11 | 23 | 15 | 13 | 12 | 13 | 8 | 19 | 20 | 7 |
| 17 | 20 | 11 | 15 | 13 | 22 | 6 | 21 | 5 | 9 | 23 | 12 | 18 | 10 | 17 | 8 | 13 |
| 18 | 23 | 5 | 7 | 14 | 22 | 7 | 25 | 10 | 18 | 5 | 10 | 20 | 16 | 14 | 14 | 14 |
| 19 | 13 | 8 | 15 | 10 | 17 | 12 | 15 | 6 | 13 | 18 | 9 | 20 | 19 | 13 | 22 | 11 |
| 20 | 11 | 9 | 9 | 13 | 18 | 16 | 10 | 9 | 13 | 10 | 12 | 22 | 5 | 25 | 26 | 10 |
| 21 | 16 | 12 | 2 | 17 | 19 | 13 | 16 | 8 | 19 | 7 | 13 | 22 | 5 | 22 | 19 | 12 |
| 22 | 12 | 15 | 10 | 19 | 22 | 10 | 21 | 11 | 21 | 7 | 7 | 20 | 11 | 15 | 9 | 11 |
| 23 | 16 | 13 | 8 | 12 | 7 | 16 | 18 | 7 | 4 | 28 | 23 | 16 | 16 | 24 | 0 | 12 |
| 24 | 21 | 11 | 11 | 13 | 15 | 9 | 15 | 11 | 20 | 4 | 11 | 16 | 13 | 22 | 18 | 15 |
| 25 | 18 | 9 | 20 | 15 | 18 | 7 | 9 | 4 | 18 | 16 | 12 | 19 | 8 | 20 | 17 | 10 |
| 26 | 18 | 11 | 19 | 12 | 9 | 9 | 17 | 3 | 23 | 11 | 10 | 18 | 21 | 11 | 18 | 11 |
| 27 | 19 | 6 | 6 | 16 | 23 | 6 | 14 | 4 | 21 | 8 | 12 | 18 | 17 | 22 | 18 | 12 |
| 28 | 15 | 12 | 7 | 21 | 13 | 18 | 3 | 9 | 22 | 14 | 11 | 22 | 7 | 18 | 18 | 11 |
| 29 | 19 | 13 | 13 | 8 | 16 | 4 | 23 | 8 | 18 | 15 | 7 | 18 | 20 | 19 | 9 | 11 |
| 30 | 16 | 3 | 4 | 14 | 10 | 15 | 18 | 11 | 20 | 19 | 15 | 20 | 12 | 23 | 10 | 13 |
| 31 | 8 | 13 | 4 | 15 | 14 | 16 | 15 | 4 | 14 | 12 | 10 | 24 | 20 | 26 | 15 | 12 |
| 32 | 28 | 13 | 4 | 13 | 18 | 11 | 14 | 8 | 12 | 15 | 10 | 15 | 19 | 21 | 9 | 11 |
| 33 | 14 | 9 | 5 | 14 | 21 | 11 | 11 | 8 | 15 | 12 | 10 | 15 | 18 | 26 | 21 | 12 |
| 34 | 13 | 16 | 12 | 7 | 7 | 7 | 18 | 7 | 21 | 19 | 12 | 21 | 15 | 16 | 19 | 10 |
| 35 | 19 | 11 | 5 | 16 | 18 | 13 | 23 | 5 | 9 | 20 | 14 | 21 | 17 | 14 | 5 | 14 |

APPENDIX A - Continued

| # | ack | del | ord | ord | out | off | int | sup | don | abs | pur | abs | end | bet | arg | con |
|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 36 | 17 | 15 | 13 | 14 | 4 | 12 | 23 | 6 | 20 | 17 | 17 | 9 | 15 | 19 | 9 | 10 |
| 37 | 19 | 4 | 7 | 14 | 15 | 16 | 12 | 8 | 13 | 10 | 16 | 19 | 20 | 24 | 13 | 10 |
| 38 | 9 | 11 | 12 | 20 | 8 | 19 | 21 | 11 | 14 | 9 | 15 | 12 | 16 | 21 | 12 | 12 |
| 39 | 15 | 10 | 11 | 21 | 14 | 14 | 17 | 15 | 11 | 12 | 12 | 16 | 11 | 14 | 17 | 9 |
| 40 | 13 | 14 | 13 | 17 | 13 | 20 | 3 | 16 | 12 | 12 | 17 | 20 | 7 | 19 | 14 | 10 |
| 41 | 21 | 10 | 6 | 18 | 15 | 13 | 11 | 4 | 20 | 9 | 12 | 17 | 19 | 25 | 10 | 8 |
| 42 | 10 | 10 | 11 | 12 | 21 | 10 | 15 | 11 | 9 | 20 | 11 | 16 | 18 | 21 | 7 | 11 |
| 43 | 12 | 9 | 17 | 12 | 16 | 9 | 20 | 17 | 18 | 5 | 7 | 17 | 19 | 27 | 6 | 11 |
| 44 | 15 | 8 | 7 | 15 | 13 | 13 | 19 | 4 | 19 | 6 | 10 | 17 | 22 | 27 | 15 | 14 |
| 45 | 11 | 10 | 17 | 12 | 14 | 10 | 7 | 14 | 20 | 14 | 12 | 11 | 13 | 27 | 18 | 11 |
| 46 | 19 | 10 | 7 | 12 | 17 | 21 | 21 | 2 | 16 | 8 | 23 | 17 | 14 | 9 | 14 | 14 |
| 47 | 17 | 11 | 12 | 10 | 15 | 20 | 15 | 16 | 10 | 12 | 16 | 21 | 9 | 13 | 13 | 13 |
| 48 | 13 | 8 | 9 | 14 | 15 | 13 | 16 | 11 | 22 | 13 | 22 | 10 | 15 | 15 | 14 | 8 |
| 49 | 12 | 15 | 12 | 14 | 15 | 15 | 15 | 12 | 18 | 14 | 16 | 16 | 12 | 18 | 6 | 8 |
| 50 | 18 | 10 | 6 | 19 | 17 | 17 | 7 | 14 | 20 | 14 | 10 | 18 | 7 | 20 | 13 | 9 |
| 51 | 20 | 9 | 8 | 14 | 18 | 14 | 9 | 10 | 14 | 11 | 13 | 20 | 25 | 19 | 6 | 11 |
| 52 | 21 | 15 | 7 | 8 | 11 | 19 | 23 | 4 | 17 | 8 | 13 | 16 | 21 | 9 | 18 | 11 |
| 53 | 18 | 12 | 22 | 17 | 9 | 9 | 21 | 9 | 11 | 9 | 10 | 17 | 11 | 19 | 16 | 12 |
| 54 | 18 | 17 | 22 | 10 | 12 | 10 | 12 | 10 | 14 | 10 | 13 | 14 | 23 | 18 | 7 | 7 |
| 55 | 22 | 9 | 2 | 12 | 16 | 12 | 19 | 9 | 7 | 23 | 20 | 19 | 18 | 10 | 12 | 13 |
| 56 | 26 | 7 | 7 | 17 | 18 | 16 | 12 | 9 | 22 | 6 | 12 | 11 | 21 | 11 | 15 | 14 |
| 57 | 19 | 10 | 9 | 14 | 21 | 10 | 21 | 2 | 17 | 11 | 13 | 11 | 23 | 16 | 13 | 13 |
| 58 | 9 | 5 | 11 | 11 | 19 | 13 | 13 | 10 | 23 | 6 | 10 | 21 | 15 | 20 | 24 | 13 |
| 59 | 16 | 12 | 7 | 13 | 12 | 19 | 21 | 3 | 14 | 13 | 18 | 22 | 12 | 15 | 13 | 11 |
| 60 | 14 | 12 | 6 | 19 | 13 | 15 | 17 | 7 | 21 | 14 | 20 | 10 | 15 | 15 | 11 | 11 |
| 61 | 11 | 11 | 9 | 17 | 19 | 19 | 18 | 8 | 19 | 6 | 14 | 24 | 4 | 18 | 13 | 13 |
| 62 | 16 | 9 | 13 | 14 | 23 | 15 | 11 | 3 | 24 | 14 | 16 | 9 | 20 | 8 | 15 | 12 |
| 63 | 23 | 9 | 9 | 16 | 19 | 9 | 17 | 12 | 21 | 8 | 4 | 19 | 8 | 17 | 19 | 11 |
| 64 | 15 | 10 | 15 | 18 | 16 | 18 | 10 | 9 | 13 | 12 | 15 | 22 | 6 | 16 | 7 | 8 |
| 65 | 9 | 9 | 10 | 10 | 18 | 10 | 12 | 15 | 18 | 20 | 15 | 18 | 13 | 19 | 14 | 11 |
| 66 | 20 | 5 | 8 | 16 | 14 | 19 | 21 | 4 | 16 | 6 | 17 | 19 | 12 | 23 | 10 | 14 |
| 67 | 19 | 7 | 8 | 15 | 17 | 9 | 24 | 12 | 25 | 3 | 17 | 11 | 5 | 23 | 15 | 15 |
| 68 | 22 | 11 | 9 | 24 | 16 | 13 | 16 | 9 | 16 | 8 | 3 | 17 | 7 | 25 | 14 | 11 |
| 69 | 25 | 14 | 8 | 12 | 23 | 9 | 22 | 6 | 16 | 3 | 5 | 17 | 20 | 19 | 11 | 12 |

[The page contains faint, illegible handwritten text.]

[The page contains faint, illegible handwritten text.]

[illegible]

[The page contains faint, illegible text, likely bleed-through from the reverse side.]

1. The first part of the document discusses the importance of maintaining accurate records of all transactions, including sales, purchases, and expenses. It emphasizes the need for a systematic approach to record-keeping, such as using a ledger or accounting software, to ensure that all data is properly documented and organized.

2. The second part of the document focuses on the importance of regular reconciliation. This involves comparing the company's internal records with external statements, such as bank statements or supplier invoices, to identify any discrepancies or errors. Regular reconciliation helps to ensure the accuracy of the financial data and allows for the timely identification and correction of mistakes.

3. The third part of the document discusses the importance of maintaining proper documentation for all financial transactions. This includes keeping receipts, invoices, and other supporting documents for a sufficient period of time to allow for verification and audit. Proper documentation is essential for ensuring the integrity of the financial records and for providing evidence in the event of a dispute or audit.

4. The fourth part of the document discusses the importance of maintaining accurate records of all assets and liabilities. This includes tracking the value of the company's property, equipment, and other assets, as well as recording all debts and obligations. Accurate records of assets and liabilities are essential for determining the company's net worth and for providing a clear picture of its financial position.

5. The fifth part of the document discusses the importance of maintaining accurate records of all income and expenses. This includes tracking all revenue generated by the company, as well as all costs incurred in the course of its operations. Accurate records of income and expenses are essential for determining the company's profitability and for providing a clear picture of its financial performance.

6. The sixth part of the document discusses the importance of maintaining accurate records of all taxes and other legal obligations. This includes tracking all taxes paid or owed, as well as other legal requirements, such as payroll taxes or environmental regulations. Accurate records of taxes and other legal obligations are essential for ensuring compliance with applicable laws and for avoiding penalties or fines.

7. The seventh part of the document discusses the importance of maintaining accurate records of all financial statements. This includes preparing and maintaining a balance sheet, income statement, and cash flow statement. Accurate financial statements are essential for providing a clear picture of the company's financial position and for making informed decisions about its future operations.

8. The eighth part of the document discusses the importance of maintaining accurate records of all financial transactions. This includes tracking all sales, purchases, and expenses, as well as all other financial activities. Accurate records of all financial transactions are essential for ensuring the integrity of the financial records and for providing evidence in the event of a dispute or audit.

9. The ninth part of the document discusses the importance of maintaining accurate records of all financial transactions. This includes tracking all sales, purchases, and expenses, as well as all other financial activities. Accurate records of all financial transactions are essential for ensuring the integrity of the financial records and for providing evidence in the event of a dispute or audit.

10. The tenth part of the document discusses the importance of maintaining accurate records of all financial transactions. This includes tracking all sales, purchases, and expenses, as well as all other financial activities. Accurate records of all financial transactions are essential for ensuring the integrity of the financial records and for providing evidence in the event of a dispute or audit.

[The page contains faint, illegible handwritten text.]

1950

Approved:

Frederic Myers

Donald Schubert

Raymond Ulyman

Date: _____

